WHAT IS CLAIMED IS:

1. A system for designing a vehicle by enabling dynamic placement of paint spray particles into a flow domain to permit visual observation and alteration of resulting particle trajectories under a computed flow solution over a computer aided design (CAD) model representative of a desired portion of the vehicle represented on a display by a computer having memory, a processor and a user input mechanism associated therewith, said system comprising:

spray gun placement code means operable with the user input mechanism to dynamically effect a desired placement of at least one paint spray gun on the display with respect to the desired portion of the CAD model;

trajectory determination code means for computing at least one trajectory for a particle stream emanating from the at least one paint spray gun relative to the desired portion of the CAD model for a predetermined set of particle characteristics in a predetermined set of particle external conditions; and

trajectory display code means for effecting display of the at least one trajectory with respect to the desired portion of the CAD model.

2. A system as set forth in claim 1 wherein the spray gun placement code means includes GUI means for displaying a spray gun GUI on the display, the GUI means operative with the input mechanism for locating the desired placement of the at least one paint spray gun.

3. A system as set forth in claim 1 wherein the predetermined set of particle characteristics includes at least one of a set of particle diameter data, particle density data, and particle initial velocity data.

4. A system as set forth in claim 1 wherein the trajectory display code means includes code means for displaying coordinate information of the display relative to the CAD model for intersection of the at least one trajectory with the desired portion of the vehicle.

5. A method for designing a vehicle using particle trajectory analysis with a computer aided design (CAD) model representative of the vehicle, said method comprising the steps of:

preparing a CAD model of a desired portion of the vehicle;

placing a paint spray gun at a desired location with respect to the desired portion of the vehicle;

specifying a set of particle information describing particles to be sprayed from the paint spray gun;

computing a trajectory for a particle stream emanating from the paint spray gun;

displaying the trajectory relative to the desired portion of the vehicle on a display to permit visual observation thereof; and

repositioning the paint spray gun if necessary to achieve a desired trajectory.

6. A method for designing a motor vehicle by enabling dynamic placement of paint spray particles into a flow domain to permit visual observation and alteration of resulting particle trajectories with respect to a computer

aided design (CAD) model representative of the vehicle, said method comprising the steps of:

storing a first set of data representing a CAD model of a desired portion of the vehicle into a computer memory;

displaying the first set of data on a video display screen;

placing at least one paint spray gun at a desired location with respect to the desired portion of the vehicle by storing a second set of data representing the at least one paint spray gun in the computer memory;

storing a third set of data in the computer memory representing particle information describing particles to be sprayed from the paint spray gun;

computing a fourth set of data representing a trajectory for a particle stream emanating from the paint spray gun using the first, second and third sets of data;

displaying the fourth set of data representing a trajectory relative to the first set of data representing a desired portion of the vehicle on the video display screen to permit visual observation thereof; and

dynamically repositioning the paint spray gun if necessary to achieve a desired trajectory by manipulating the second set of data in the computer memory.